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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/599,547

08/10/2007

Takahito Tanibuchi

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26021 7590 08/14/2009  
HOGAN & HARTSON L.L.P.  
1999 AVENUE OF THE STARS  
SUITE 1400  
LOS ANGELES, CA 90067

EXAMINER

KATZ, VERA

ART UNIT

PAPER NUMBER

1794

NOTIFICATION DATE

DELIVERY MODE

08/14/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ctkeyner@hhlaw.com  
LAUSPTO@hhlaw.com  
lbrivero@hhlaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/599,547	<b>Applicant(s)</b> TANIBUCHI ET AL.	
	<b>Examiner</b> Vera Katz	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-15, 22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-21 and 24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/29/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group II, Claims 16-21 and 24 in the reply filed on 07/09/09 is acknowledged. Claims 1-15 and 22-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected subject matter, there being no allowable generic or linking claim.

### ***Information Disclosure Statement***

2. The Examiner noted a list of references cited on p. 1 and 2 of the instant disclosure. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 16-21 and 24 are rejected under 35 U.S.C. 102(a) and 102(e) as being anticipated by Fukano; (2004/016139).

Considering claims 16-17, Fukano teaches a surface coating member having a substrate 2, and a hard coating layer 3 including titanium carbonitride layer 4 and aluminum oxide layer 6 coated on the surface of the titanium carbonitride layer 4. The titanium carbonitride layer 4 is composed of multilayer including a lower titanium carbonitride layer 4b and an upper titanium carbonitride layer 4a. Fukano further teaches as observed in the Calotest, at the periphery of the substrate in the dents or depressions, lower structure is having no or few cracks and upper structure is having higher density of cracks; [Figs. 7(a), 7(b), 9 and 0030-0031].

Considering claim 18, as taught by Fukano, the thickness of the lower TCN layer is in the range of 1-10  $\mu\text{m}$ , and the thickness of the upper layer is in the range of 0.5-5  $\mu\text{m}$  and the condition of the instant claim is satisfied; [0062].

Considering claims 19-20, Fukano discloses that the layer 4 comprises a stringer-like lower and upper TiCN layers growing vertically, [Fig. 2 and claim 1]. The string-like layers are considered to be columnar layers. As taught by the reference, the mean crystal width of the lower layer is in a range of 0.1-0.7  $\mu\text{m}$  and the mean crystal width of the upper layer is in a range of 0.5-1  $\mu\text{m}$ , the mean crystal width of the upper layer is greater than that of the lower layer; [0058-0060, 0025 and 0198].

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Considering claim 21, the reference teaches the upper carbon-rich TiCN layer having the ratio of C/N in the range of 1.5-4 and the lower nitrogen-rich layer with the ratio of C/N in the range of 0.2-0.7; [0026]. These ranges overlap those of the instant claim.

Considering claim 24, the article is used for the cutting tool edge including rake and flank face; [0006, 0021 and 0180]

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. In the case if the rejection of claim 21 above is not considered to be anticipation, claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukano; (2004/016139). As it was shown above, the ranges of the reference overlap those of the instant claim. It would have been obvious to one of ordinary skill in the art to select the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the ranges of carbon and nitrogen in the upper and lower titanium carbonitride to provide a surface-coated tool having long service life, showing excellent high wear and breakage resistance; [0019].

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5. Claims 16-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriguchi (5871850).

Considering claims 16 and 17, Moriguchi teaches a coated hard metal or a coated surface member, comprising a substrate 1, a hard coating layer including titanium carbonitride multilayer composed of a lower or an inner surface layer 2 and an upper or outer surface layer 4 comprising at least one layer of titanium carbonitride; [abstract and col. 8, lines 24-27]. The open-ended transitional phrase “including” allows other layers to be present in the structure. Furthermore, Moriguchi teaches an aluminum oxide layer disposed on the titanium carbonitride outer layer 4; [col. 12, lines 25-27].

It has been noted by the Examiner that the claimed observed post-manufactured structural features such as depressions having spherical surface, lower structure with no or few cracks and upper structure with higher density of cracks than that of the upper structure are not related to the original structure of the surface coated member, but are caused by and resulted from conducting a hard ball wear test, identified in the instant disclosure as Calotest. The coated surface member, as it was shown immediately above and below, has a structure similar to that of the claimed, it is fabricated by CVD or PVD techniques that are similar to those of the instant application from identical precursors; [col. 12, lines 1-24]. The application for hard cutting tools is also similar. Therefore, based on similarities of the materials, structure, the method of making the product, the changes in the structure caused by hard ball test is expected to also be commensurate with the instant claim limitations. It has been held that where the claimed and prior art products are identical or substantially identical in structure or

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are produced by identical or a substantially identical processes, a prima facie case of either anticipation or obviousness will be considered to have been established over functional limitations that stem from the claimed structure. In re Best, 195 USPQ 430, 433 (CCPA 1977). In addition, it would have been obvious to one of ordinary skill in the cutting tool art to test the reference structure for the wear resistance using Calotest.

Considering claim 18, Moriguchi teaches that the lower layer is at least one titanium carbonitride layer having a thickness in the range of 0.1 to 5 microns, and the thickness of the outer layer is in the range of 5 to 100 microns; [col. 3, lines 41-47 and claim 1]. These ranges overlap those of the instant claim. Applying one lower layer of 5 micron thick and outer layer of 5 micron thick would give the ratio of  $t_3/t_4=1$ , that is substantially close to the instant claim. But applying more than one inner layer the  $t_3/t_4$  range will overlap that of the instant claim. Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference by combining more than one inner layer with upper layer because overlapping ranges have been held to be a prima facie case of obviousness, In re Malagari, 182 USPQ 549.

Considering claims 19-20, Moriguchi teaches that the crystals in lower (inner) titanium carbonitride layer and in upper (outer) titanium carbonitride layer have a columnar structure and grow vertically. The aspect ratio is 5-80 for the upper layer and 5-30 for the lower layer [Figs. 7-8, col. 11, lines 6-8 and col. 10, lines 36-45]. As it shown in Figs. 7-8 the length of the crystals is equal to the thickness of the film and is shown immediately above. Therefore, based on aforesaid, the calculated ranges of

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crystal width of the upper and lower layers as well as  $w_3/w_4$  overlap those of the instant claims.

Considering claim 24, Moriguchi teaches that the material is applied for the cutting edge of the cutting tools; [col. 3, lines 10-15 and col. 12, line 52-53].

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moriguchi (5871850) in view of Tokunaga (20040137219). Moriguchi further discloses a that the excellent wear resistance is attained in the upper layer when the C:N ratio of TiCN is in the range of 5:5 to 7:3; [col. 10, lines 46-49 and col. 12, lines 21-23]. This range overlaps that of the instant claim, when the latter is normalized. Moriguchi is silent about the C and N ratios or conditions for the TiCN lower layer. However, Tokunaga teaches a cutting tool substrate coated with a carbonitride coating layer having a composition  $Ti_xM_{1-x}(C_yN_{1-y})$ , wherein x is 0.4-1 and y is in the range of 0-1; [0057]. Furthermore, in the case of  $x=1$  and the range of y being between 0.2 and 0.45, the instant claim condition for the lower titanium carbonitride layer is satisfied. It would have been obvious to one of ordinary skill in the art to modify a surface coating member of Moriguchi incorporating TiCN lower layer with the range of C and N as taught by Tokunaga because this modification would improve critical properties of the tool providing high hardness and high heat resistance including high temperature stability; [Tokunaga, 0057].

Claims 16-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriguchi (6183846)..



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Considering claims 16 and 17, Moriguchi teaches a coated hard metal or a coated surface member, comprising a substrate 1, a hard coating layer including titanium carbonitride multilayer composed of a lower or an inner surface layer 2 and an upper or outer surface layer 4 comprising at least one layer of titanium carbonitride; [abstract and col. 8, lines 56-63]. The open-ended transitional phrase “including” allows other layers to be present in the structure. Furthermore, Moriguchi teaches an aluminum oxide layer disposed on the titanium carbonitride outer layer 4; [col. 12, lines 55-57].

It has been noted by the Examiner that the claimed observed post-manufactured structural features such as depressions having spherical surface, lower structure with no or few cracks and upper structure with higher density of cracks than that of the upper structure are not related to the original structure of the surface coated member, but are caused by and resulted from conducting a hard ball wear test, identified in the instant disclosure as Calotest. The coated surface member, as it was shown immediately above and below, has a structure similar to that of the claimed, it is fabricated by CVD or PVD techniques that are similar to those of the instant application from identical precursors; [col. 12, lines 31-54]. The application for hard cutting tools is also similar. Therefore, based on similarities of the materials, structure, the method of making the product, the changes in the structure caused by hard ball test is expected to also be commensurate with the instant claim limitations. It has been held that where the claimed and prior art products are identical or substantially identical in structure or are produced by identical or a substantially identical processes, a prima facie case of either anticipation or obviousness will be considered to have been established over

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functional limitations that stem from the claimed structure. In re Best, 195 USPQ 430, 433 (CCPA 1977). In addition, it would have been obvious to one of ordinary skill in the cutting tool art to test the reference structure for the wear resistance using Calotest.

Considering claim 18, Moriguchi teaches that the lower layer is at least one titanium carbonitride layer having a thickness in the range of 0.1 to 5 microns, and the thickness of the outer layer is in the range of 5 to 100 microns; [col. 3, lines 58-65 and claim 1]. These ranges overlap those of the instant claim. Applying one lower layer of 5 micron thick and outer layer of 5 micron thick would give the ratio of  $t_3/t_4=1$ , that is substantially close to the instant claim. But applying more than one inner layer the  $t_3/t_4$  range will overlap that of the instant claim. Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference by combining more than one inner layer with upper layer because overlapping ranges have been held to be a prima facie case of obviousness, In re Malagari, 182 USPQ 549.

Considering claims 19-20, Moriguchi teaches that the crystals in lower (inner) titanium carbonitride layer and in upper (outer) titanium carbonitride layer have a columnar structure and grow vertically. The aspect ratio is 5-80 for the upper layer and 5-30 for the lower layer [Figs. 7-8, col. 11, lines 1-5 and 36-38]. As it shown in Figs. 7-8 the length of the crystals is equal to the thickness of the film and is shown immediately above. Therefore, based on aforesaid, the calculated ranges of crystal width of the upper and lower layers as well as  $w_3/w_4$  overlap those of the instant claims.

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Considering claim 24, Moriguchi teaches that the material is applied for the cutting edge of the cutting tools; [col. 3, lines 22-24 and col. 13, lines 5-15].

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 16-18 and 21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 22 and 19 of copending Application No. 10/780527. . Claim 22 recites all the limitations of the instant claims 16-17, with the exception of the wording “Calotest”. However, it should be understood that the observation of the article presented in instant claims 16-17 are results received after conducting the Calotest, therefore, these claims are not patentably distinct over the reference. Claim 22, teaches the range of x in the carbonitride formula

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which is the same as the range of m in instant claim 21. The ranges of the thickness of the lower and upper films recited in claim 19 are the same as in instant claim 18.

This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, see attached form PTO-892.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Katz whose telephone number is (571)270-7082.

The examiner can normally be reached on M - Th 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JENNIFER McNEIL can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vera Katz/  
Examiner, Art Unit 1794

/JENNIFER MCNEIL/

Supervisory Patent Examiner, Art Unit 1794